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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Inventors: Joachim LOHR, et al.

Appln. No.: 10/583,671

Filed: June 21, 2006

For: QUALITY-OF-SERVICE (QOS)-AWARE SCHEDULING
FOR UPLINK TRANSMISSION ON DEDICATED
CHANNELS

PETITION TO MAKE SPECIAL

Assistant Commissioner of Patents
Washington, DC 20231

Sir:

The Applicants respectfully petition that the above-captioned application be granted special status. The requirements of MPEP section 708.02(VIII) are complied with as follows:

(1) The petition fee set forth in 37 CFR 1.17(i) is authorized to be charged to Deposit Account No. 19-4375.

(2) All pending claims (claims 37-78) of the present application are believed to be directed to a single invention; if the Office determines that all the claims presented are not obviously directed to a single invention, the Applicants agree to

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make an election without traverse as a prerequisite to the grant of special status.

(3) A pre-examination search has been made in the form of a search report in a counterpart PCT International Application (International Search Report dated November 11, 2005). Under MPEP 708.02, VIII, a search made by a foreign patent office satisfies the search requirement. An Information Disclosure Statement directed to the references cited in the ISR was filed on June 21, 2006.

Also, a pre-examination search has been made, and an Information Disclosure Statement directed thereto is attached.

The field of search is:

Class 370, subclasses 232, 252, 253, 328, 329, 330, and
475; and

Class 455, subclasses 500 and 515.

Examiners Wellington chin and John Pezzlo were consulted for the above field of search.

(4) One copy each of the prior art deemed most closely related to the subject matter encompassed by the claims is of record in the form of the art cited in the Information Disclosure Statement filed June 21, 2006, and the Information Disclosure Statement filed herewith.

(5) The following is a detailed discussion of the art of record, and comments pointing out how the instant claimed subject matter is patentably distinguishable thereover.

A. Discussion of All References of Record

D. Chase: "Code combining: A maximum-likelihood decoding approach for combining an arbitrary number of noisy packets", IEEE Transactions on Communications, Col. COM-33, pages 385 to 393, May 1985 discussed in the paragraph bridging application pages 2 and 3 states that in chase-combining, retransmission packets carry identical symbols, and multiple received packets are combined either by a symbol-by-symbol or by a bit-by-bit basis and are stored in the soft buffers of respective HARQ processes.

3GPP TR 25.401, "UTRAN Overall Description" discussed at application page 4, first full paragraph, discloses the high level R99/4/5 architecture of Universal Mobile Telecommunication System (UMTS), as shown in application Fig. 1.

3GPP TR 25.896, "Feasibility Study for Enhanced Uplink for UTRA FDD (Release 6)" discussed at application page 4, last paragraph, discusses uplink enhancements for Dedicated Transport Channels (DTCH).

3GPP TSG RAN WG1, meeting #31, Tdoc R01-030284, "Scheduled and Autonomous Mode Operation for the Enhanced Uplink" discussed at application page 5, second to last paragraph, describes a new MAC sub-layer called MAC-e.

3GPP TSG RAN WG 1, meeting #31, "HARQ Structure", Tdoc R1-030247, is discussed at application page 7, first partial paragraph. Every MAC-e entity corresponds to a user (UE), and application Fig. 6 depicts the base station (Node B) MAC-e architecture. Fig. 7 shows the S-RNC MAC-e architecture which comprises the reordering buffer of the corresponding user (UE). The number of reordering buffers is equal to the number of data flows in the corresponding MAC-e entity on the UE side. Data and control information is sent from all Node Bs within the active set to S-RNC during soft handover.

3GPP TR 25.896, "Feasibility study for Enhanced Uplink for UTRA FDD (Release 6)" is discussed at application page 9, last paragraph. Due to Node B being unaware of the number of UEs transmitting at the same time, no precise control of the uplink noise rise in the cell may be possible.

3GPP TS 25.321, "Medium Access Control (MAC) Protocol Specification; (Release 6)", version 6.1.0, is discussed at application page 13, first full paragraph, and gives details of the UMTS TFC selection procedure.

3GPP TS 23.107, "Quality of Service (QoS) concept and architecture", V6.1.0 is discussed at application page 13, third full paragraph, and presents the different types of information expected to be commonly transmitted over 3G.

US 2002/159411 discloses a wireless cellular network including a base station and plural subscriber units with each subscriber unit belonging to a service class. In response to a service flow request from a subscriber unit, time slots and frequency blocks for the service flow request are scheduled based on the service class of the subscriber unit. The data requests may include information regarding the size and data type of data to be transmitted and information regarding the block weight of the request. The scheduler then utilizes the data size, the data type and the designated service class of the subscriber units for generating the schedule. A service flow table may include a service flow request identification number that identifies each individual service flow request.

3GPP TSG-RAN WG1 #36, "TP on E-DCH System Performance-Traffic Models-Boosted Mode" R1-040275, discusses enhanced uplink via hybrid ARQ, higher data rates and shorter transmit time interval length.

WO 0163855 discloses packet scheduling in accordance with quality of service (QoS) constraints for data flows, including

permitted transport format combinations (TFCs) from a TFC set (TFCS). A Medium Access Control (MAC) layer schedules packet transmission of various data flows to meet stipulated criteria, including permitted transport format combinations (TFCs) from a TFC set (TFCS). The TFC may be selected based on guaranteed rate transmission rates, weighted fair queuing transmission rates, QoS class, transport block set size, and optionally queue fill levels.

WO 02065675 discloses a system for multiplexing a plurality of data streams (for example, from plural subscriber units) onto one data stream based on data stream priorities, available transport format combinations (TFCs), and transmission time interval (TTI) constraints of transport frames within the TFCs.

US 2004/102202 discloses a technique for uplink scheduling in a wireless network. The technique includes performing a first selection among plural mobile units requesting transmission for a given time period based at least in part on a first criterion. Then, a second selection is performed of one or more of the first selected mobile units. Next, the system selects which mobile unit or units are to transmit during a time period in accordance with a second criterion which is based on one or more properties of the mobile units to transmit during the time period. Mobile units may be classified based on a property of the mobile unit,

such as a probability of being correctly decoded, a received power, or a received signal to interference ratio.

US 2003/012220 discloses a scheduling method for a shared channel in a wireless packet communication system. A priority of the communication terminals is determined according to a service type, a terminal grade and ratio of carrier signal to interference from the respective terminals. Packet data is transmitted to each terminal based on the determined priority through the shared channel. A higher priority may be based on a transmission delay and a throughput of packets on each terminal. The higher priority may be determined by individually allocating weights to the carrier signal to interference ratio, the terminal grade and the service type, and one of the transmission delay and the throughputs of the packets.

WO 03085903 discloses a technique for packet scheduling for a packet data enabled radio communication network that avoids interference of non-real time data connections with real time data connections. Traffic flow is classified into service class specific traffic queues.

WO 04049591 discloses a method for determining a set of acceptable transport format combinations for transmission on a current time frame. The transport channels are mapped to a set of physical channels for transmission from the mobile station in

accordance with a determined power level and data rate over a set of time slots in the current time frame.

WO 03053010 discloses a system wherein a mobile unit sends a request to a base station to send a message, and, within the request is an identifier providing the base station with an identification of the priority level for the particular message (for example, high, medium, or low), such as a public safety message or certain police messages. The base station schedules transmission from the mobile unit based initially on the priority level. The base station schedules transmissions from each of the mobile units based upon the priority identifier.

3GPP TSG RAN1 #38BIS, Panasonic, "Uplink power signalling information for the scheduling," discusses uplink signaling information required for Node B controlled scheduling of communication terminals and particularly transmit power status information. The document notes that, when channel conditions become poor between uplink reporting and scheduling command, the UE's transmission power increases and the UE could reach maximum transmission power. In this case, the UE cannot transmit requested power. The document notes that this behavior is not limited to total power domain scheduling, but is common to the entire scheduling domain. The document discusses a method in

which the UE reports remaining transmission power to maximum allowed transmission power.

USPN 6,760,344 discloses a wireless communication system which enables quality of service provisioning for a given mobile terminal by assigning a temporary logical link identifier (TLLI) that implicitly reflects a QoS rating for a mobile terminal. A serving GPRS support node assigns temporary logical link identifiers (TLLI) for a first QoS rating and for a second QoS rating. Upon receiving a TLLI value, a base station and the corresponding mobile terminal may both evaluate the TLLI number to determine the assigned QoS rating for the mobile unit and to allocate communication resources in a corresponding manner.

USPN 6,747,962 discloses a method for increasing the flexibility of uplink resource allocation for a mobile station (MS) with plural data flows per MS. An allocated uplink resource (an Uplink State Flag (USF)) is associated with one or more Temporary Block Flows (TBFs) for a Packet Data Channel (PDCH), and not with a MS per se (although a given USF is associated with only a single MS). A Temporary Flow Identity (TFI) is used for identifying a TBF, where a TFI may be unique to a PDCH and, if not, is unique with respect to the MS on a PDCH (and hence with respect to the USF). Col. 6, lines 12-18 states that MS 100 is free to send any of its TBFs on a PDCH on the allocated (fixed or

dynamic) resources of the PDCH, provided the TFIs are unique with respect to MS 100 on the PDCH, and possibly to the PDCH alone. That is, the NW schedules MS 100 in the uplink, but MS 100 schedules its TBFs in the uplink on the allocated resources of the PDCH.

USPN 6,728,365 discloses a method of Resource Reservation Protocol (RSVP) QoS signaling in a wireless network.

B. Discussion of How the Claimed Invention Patentably Distinguishes over the References of Record

It is submitted that the references cited above, considered either alone or in combination, fail to disclose or suggest the subject matter of independent claims 37 and 58 of scheduling transmissions of plural mobile terminals on a dedicated uplink (UL) channel, wherein:

(1) the base station receives quality of service information relating to the data flow of each mobile terminal on the UL channel;

(2) a scheduling request provided by a mobile terminal to the base station includes an identifier identifying the data flow; and

(3) the base station schedules the transmission of the mobile terminals based on the identifier and the quality of

service information relating to the data flow identified by the identifier.

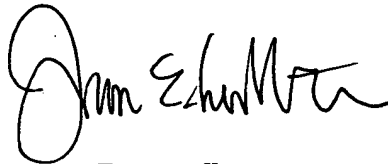
US 2002/159411 teaches scheduling based on service class of the subscriber and the request from the subscriber includes size and data type of data to be transmitted and information regarding the block weight of the request. WO 0163855 discloses packet scheduling in accordance with quality of service (QoS) constraints for data flows. US 2003/012220 discloses scheduling based on a priority of the communication terminals that is based on service type, terminal grade and ratio of carrier signal to interference from the respective terminals. WO 03053010 discloses a request from a mobile unit to a base station to send a message, wherein the request includes an identifier identifying the priority level for the particular message. USPN 6,747,962 discloses a system with plural data flows per MS. However, each of these references appears to lack any scheduling of transmissions of the mobile terminals based on an identifier that identifies the data flow and the quality of service information relating to the flow identified by the identifier. It is submitted that the other references of record depart even further from the present claimed subject matter and do not cure the above-noted deficiencies of these references.

Thus, the Applicants submit that the above-noted combinations of features of the independent claims are not taught or suggested by the combined teachings of the art of record, and thus the independent claims, and all claims dependent therefrom, are patentable.

Accordingly, in light of the foregoing discussion pointing out how the claimed invention distinguishes over the cited references, the Applicants respectfully submit that the inventions of all the presently pending claims are not anticipated by these references and would not have been obvious over any combination thereof.

Grant of special status in accordance with this petition is respectfully requested.

Respectfully submitted,



James E. Ledbetter
Registration No. 28,732

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JEL/att
ATTORNEY DOCKET NO. L7725.06114
STEVENS, DAVIS, MILLER & MOSHER, L.L.P.
1615 L STREET, NW, Suite 850
WASHINGTON, DC 20043-4387
Telephone: (202) 785-0100
Facsimile: (202) 408-5200